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GRAY SPOT EDEMA OF RHAPHIOLEPIS

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The genus Rhaphiolepis (3) contains fifteen species of evergreen shrubs from China and Japan (2). As a landscape plant for mild climate regions, Rhaphiolepis spp. provide attractive foliage, flowers and fruit (2,4). A physiological affliction known as edema can occur on Rhaphiolepis umbellata (Thunb.) Mak. and R. X delacourii Andre in both greenhouse and outdoor plantings in Florida.

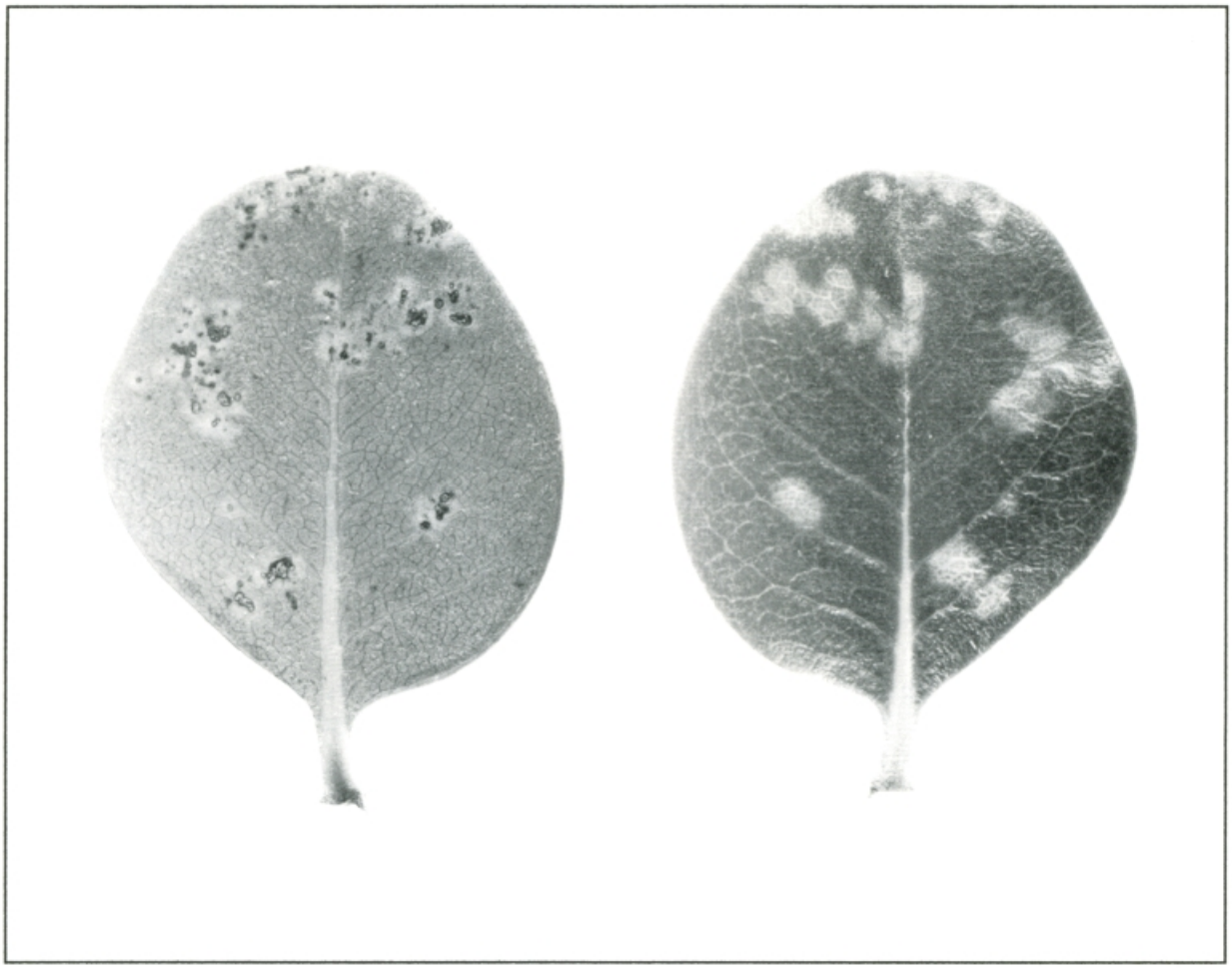

Figure 1. Raised blisters on the leaf undersurface (left) and corresponding gray spots on the upper leaf surface (right) of Rhaphiolepis umbellata X 1.9 (DPI file #89077, Jeffrey W. Lotz).

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SYMPTOMS: On the undersurface of the leaf, the initial symptoms of edema are small raised blisters. These blisters are swollen leaf mesophyll cells which eventually erupt through the leaf epidermis. Later these cells may rupture and desiccate, appearing as an overlay of tan corky tissue on the surface of the eruptions. Gray spots, circular to subcircular, up to 5 mm across, are seen on the upper leaf surface of R. umbellata (Fig. 1) opposite the edema blisters. Both the blisters and their corresponding gray spots may coalesce to form larger areas. The gray spots have sometimes been observed on the lower leaf surface of R. X delacourii. In general, the blisters and gray spots do not form simultaneously. After the leaf cells have ruptured, producing a corky blister-like swelling, the corresponding gray leaf spots begin to appear. The gray spots, however, are generally the first readily apparent indication of edema. Gray leaf spot symptoms appear to be unique to Rhaphiolepis. Physiological edema observed on such hosts as Pelargonium, Brassaia, Camellia, Peperomia, Hibiscus, Polyscias, Dracaena, and others (1,5) do not display this unique gray leaf spot in association with the leaf blistering.

Repeated attempts to isolate a pathogen from the affected tissues have been unsuccessful over the years in our laboratory. Furthermore, no insect damage has been associated with the condition.

CAUSE: Physiological edema occurs when the absorption of water by the roots exceeds the rate of transpiration or normal water loss from the leaves. Such conditions tend to occur when plant roots remain warm and moist while leaves are exposed to cool temperatures and high relative humidity, which reduce the rate of transpiration (5).

CONTROL: Symptoms of edema on an individual leaf will not disappear. New growth should be free from edema when there is a balance between water uptake and transpirational loss of water through the leaves. This balance is obtained when good growing conditions are provided, i.e. optimal ventilation, adequate spacing of plants, proper watering and well drained soils.

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